



Online Case Report

Pneumothorax, pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum and subcutaneous emphysema following diagnostic colonoscopy

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Colonic perforation is an unusual complication of colonoscopy. We present a case of pneumothorax, pneumomediastinum, pneumoperitoneum and extensive subcutaneous emphysema resulting from a diagnostic colonoscopy. To our knowledge, only two such cases have been described previously.

Keywords: Pneumothorax – Pneumomediastinum – Pneumoperitoneum – Subcutaneous emphysema – Diagnostic colonoscopy

An 89-year-old female underwent colonoscopy in a community hospital for investigation of iron-deficiency anaemia. An upper gastrointestinal endoscopy showed no pathology. Her past medical history was significant for a cerebrovascular accident, hypertension, type II diabetes mellitus and partial gastrectomy for a gastric stromal tumour 5 years earlier. Colonoscopy was performed in the left lateral position with the patient sedated using intravenous propofol. The colonoscope was carefully introduced as far as the proximal sigmoid colon. Extensive sigmoid diverticular disease was noted. At this point, the patient developed profound subcutaneous emphysema of the face, chest wall and abdomen. The procedure was immediately terminated and the patient transferred to a tertiary referral hospital. On arrival, the patient described no abdominal pain or shortness of breath. Examination revealed a well-looking woman in no respiratory distress. Pulse rate and blood pressure were normal, and oxygen saturation on room air was 99%. Subcutaneous emphysema was apparent on the face, neck, anterior chest wall, anterior and lateral abdominal walls, right upper limb to the fingertips and right lower limb. Abdominal examination revealed a distended

tympanic abdomen, but with no evidence of peritonitis. White cell count and C-reactive protein were normal. A computerised axial tomography (CT) scan of the chest, abdomen and pelvis was performed with concurrent administration of gastrograffin contrast medium per rectum. This demonstrated a right pneumothorax (occupying approximately 20% of the right thoracic cavity), pneumomediastinum, pneumoperitoneum, and pneumoretroperitoneum extending down to the perirectal planes in addition to extensive subcutaneous emphysema (Fig. 1). There was no leakage of contrast from the colon or rectum into the peritoneal cavity or retroperitoneal tissues. Non-specific thickening of the ascending colon was noted. In view of the clinical and radiological findings, the patient was managed conservatively with intravenous fluids and intravenous antibiotics for 72 h prior to gradual re-introduction of oral fluid and food. Intercostal drainage of the pneumothorax was not performed and a follow-up chest X-ray showed resolving pneumomediastinum and resolution of the pneumothorax. The patient made an uneventful recovery and was discharged home on day 7 with a view to an outpatient virtual colonoscopy.

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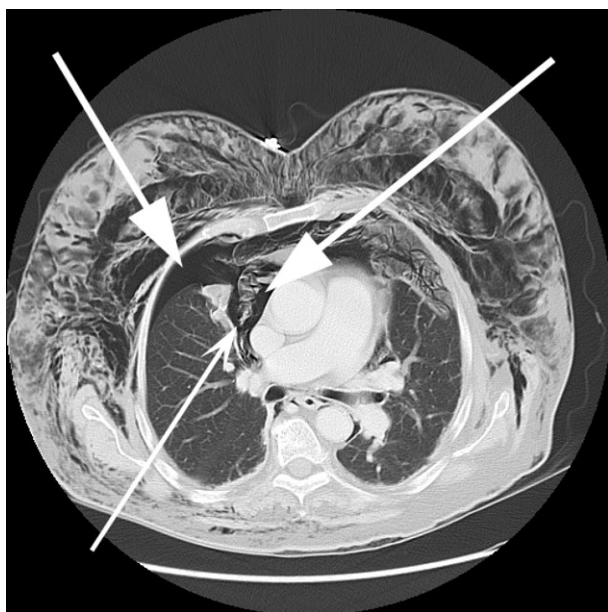


Figure 1 Axial CT scan of the chest demonstrating pneumomediastinum and a right pneumothorax (large arrows). Note communication between both (thin arrow).

Discussion

The incidence of colonic perforation following colonoscopy has been variably reported. It may be as low as 0.2% in diagnostic colonoscopies but up to 2% in therapeutic colonoscopies.¹ Risk factors for perforation include advanced age, medical co-morbidity and performance of therapeutic procedures such as polypectomy.²⁻⁴ We report a case of diagnostic colonoscopy in which air insufflation resulted in iatrogenic perforation with the patient developing the whole spectrum of extraluminal air: extensive subcutaneous emphysema, pneumothorax, pneumomediastinum, pneumoperitoneum, and pneumoretroperitoneum. Although iatrogenic perforation resulting in the presence of free air in soft tissue planes (subcutaneous emphysema, pneumomediastinum, pneumoretroperitoneum, pneumoperitoneum, pneumopericardium and pneumoscrotum) is recognised,²⁻⁴ only nine cases of pneumothorax have been published, of which only two were after diagnostic colonoscopy.²

There are different mechanisms whereby extraluminal air may reach the different body compartments.⁵ Undue

instrument manipulation, air insufflation or improper use of diathermy may result in overt colonic perforation. Alternatively, forcible herniation of the colonic mucosa may occur, such that the mucosa becomes permeable to air without an actual perforation developing.³ Air may then pass into the abdomen or thorax by a number of routes. Retroperitoneal air results either from direct retroperitoneal colonic perforation or by dissection of air through the colonic wall (pneumatosis coli) and subsequent passage along the mesentery to the retroperitoneum. Once in the retroperitoneum, air may travel along the fascial planes to enter the mediastinum. Subsequent rupture of the mediastinal pleura allows air to decompress into the pleural cavity and cause a pneumothorax. Alternatively, air in the peritoneal cavity (which may occur either as a direct breach of the colonic serosa, or a result of decompression of retroperitoneal air through the peritoneum) may pass through small diaphragmatic fenestrations and enter the pleural space by means of a pressure gradient.^{2,3}

Conclusions

Whilst a segmental resection, with or without exteriorisation of the bowel ends, has previously been considered the standard treatment of iatrogenic colonoscopic perforation, non-operative management may be appropriate in a patient with a properly prepared bowel who has no evidence of peritonitis or direct intraperitoneal perforation. It is important to be aware that profound clinical and radiological signs, such as in our patient, should not preclude such a conservative approach to management.

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